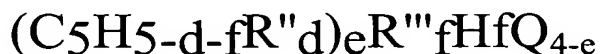


## CLAIMS

What is claimed is:

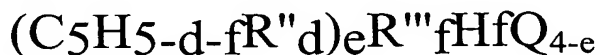
1. A catalyst system comprising a bulky ligand hafnium transition metal metallocene-type catalyst compound represented by the formula:



wherein  $(\text{C}_5\text{H}_5\text{-d-fR}''\text{d})$  is a substituted cyclopentadienyl ligand bonded to Hf, wherein at least one  $(\text{C}_5\text{H}_5\text{-d-fR}''\text{d})$  is substituted with at least one  $\text{R}''$ , wherein said  $\text{R}''$  is selected from one or more of n-propyl, isopropyl, n-butyl, isobutyl, or n-pentyl, each additional  $\text{R}''$ , which can be the same or different is hydrogen or a substituted or unsubstituted hydrocarbyl having from 1 to 30 carbon atoms or combinations thereof where two or more carbon atoms are not joined together to form a part of a substituted or unsubstituted ring or ring system,  $\text{R}'''$  is one or more or a combination of the group consisting of carbon, germanium, silicon, phosphorous and nitrogen atoms containing radical bridging two  $(\text{C}_5\text{H}_5\text{-d-fR}''\text{d})$  rings, or bridging one  $(\text{C}_5\text{H}_5\text{-d-fR}''\text{d})$  ring to Hf; each Q which can be the same or different is selected from the group consisting of a hydride, substituted and unsubstituted hydrocarbyl having from 1 to 30 carbon atoms, halogen, alkoxides, aryloxides, amides, phosphides and combination thereof; two Q's together form an alkylidene ligand or cyclometallated hydrocarbyl ligand or other divalent anionic chelating ligand; d is 1, 2, 3, or 4, f is 1 and e is 1, 2 or 3.

2. The catalyst system of claim 1, wherein e is 2.

3. A catalyst system comprising a bulky ligand hafnium transition metal metallocene-type catalyst compound represented by the formula:



wherein  $(\text{C}_5\text{H}_5\text{-d-fR}''\text{d})$  is a substituted cyclopentadienyl ligand bonded to Hf, wherein at least one  $(\text{C}_5\text{H}_5\text{-d-fR}''\text{d})$  is substituted with  $\text{R}''$ , and  $\text{R}''$  consists essentially of one of n-propyl, n-butyl, isobutyl, or isopropyl, each additional  $\text{R}''$ , which can be the same or different is hydrogen or a substituted or unsubstituted hydrocarbyl having from 1 to 30

carbon atoms or combinations thereof where two or more carbon atoms are not joined together to form a part of a substituted or unsubstituted ring or ring system,  $R'''$  is one or more or a combination of the group consisting of carbon, germanium, silicon, phosphorous and nitrogen atoms containing radical bridging two  $(C_5H_5-d-fR''_d)$  rings, or bridging one  $(C_5H_5-d-fR''_d)$  ring to Hf; each Q which can be the same or different is selected from the group consisting of a hydride, substituted and unsubstituted hydrocarbyl having from 1 to 30 carbon atoms, halogen, alkoxides, aryloxides, amides, phosphides and combination thereof ; two Q's together form an alkylidene ligand or cyclometallated hydrocarbyl ligand or other divalent anionic chelating ligand; d is 1, 2, 3, or 4, f is 1 and e is 1, 2 or 3.